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09/691,413	10/18/2000	Sang-Hee Lee	C34037/118297	4314

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EXAMINER	
CHEN, WENPENG	
ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 02/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/691,413	LEE ET AL.	
	Examiner	Art Unit	
	Wenpeng Chen	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,30,31,37-39,44-52 and 54-61 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,30,31,37-39,44-52 and 54-61 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Examiner's responses to Applicant's remark

1. Applicants' arguments and amendments filed on 9/23/2004 have been fully considered.

2. The amendments overcome:

-- the objections to Claims 30, 34, 38, 42, and 48-52 set forth in paper #12;

-- the rejections to Claims 41-43 and 53 under 35 U.S.C. 101 set forth in paper #12 by cancellation;

-- the objections to Claims 33-35 under 37 CFR 1.75 set forth in paper #12 by cancellation.

3. In the arguments, the Applicants stated that: "Applicants instead received a newly advanced rejection, citing different patents in combination, all without explanation or justification. Indeed, in issuing the rejection the Examiner states only that the new rejection is a "consequence" of Applicants overcoming the former rejection (Office Action, page 2). How the new rejection is a "consequence", i.e. was caused by, Applicant's successful traversal of the prior rejection is unstated, and is unknown to Applicants. To wit, there is no apparent causal connection at all between the rejection just withdrawn and the new grounds for rejection raised."

To respond to this argument, the Examiner calls the Applicant's attention to paragraph 2 of paper #12 in which the Examiner clearly provided the reason for need of the new grounds of rejection. The reason is based on (1) the Applicants' filed declaration under 37 C.F.R. 1.131 to

claim that at least Claim 1 is conceived and reduced to practice prior to the earliest stated U.S. filing date (9/20/1996) of Haskell et al. (US patent 6,005,622) and (2) the declaration makes Haskell not qualified as a prior art reference under 35 U.S.C. 102(e). The declaration under 37 C.F.R. 1.131 was filed on 10/27/2003 which is between date of Final Rejection paper #5 (mailed 12/25/2002) and the most recent Non-final Rejection paper #12 (mailed 3/18/2004.)

In the Final Rejection paper #5 (mailed 12/25/2002,) the Examiner based all his available knowledge made the most appropriate examination to reject Claims 1, 31-33, 35-37, 39-41, 43 and the interpreted 30, 34, 38, 42 under 35 U.S.C. 102(e) as being anticipated by Haskell et al. (US patent 6,005,622.) The declaration (filed on 10/27/2003) disqualified Haskell as a prior art reference under 35 U.S.C. 102(e). ***Before Applicants filed the declaration under 37 C.F.R. 1.131, there is no way for the Examiner to accept disqualification of Haskell as a prior art reference under 35 U.S.C. 102(e). Therefore, it is obvious that Applicants' declaration under 37 C.F.R. 1.131 necessitated the new grounds of rejection presented in paper #12.***

To the Examiner, the Applicants did not overcome the rejections based on Haskell by convincing the Examiner that the claims are different from Haskell's teaching. Instead, the Applicants overcame the rejections based on Haskell by disqualifying it with the declaration under 37 C.F.R. 1.131.

The Examiner did not make any piecemeal examination. The Applicants clearly pointed out in the arguments that "*Moreover, 'piecemeal examination should be avoided as much as possible. The examiner should reject each claim on all valid grounds available, avoiding, however, **undue multiplication** of references.' MPEP Section 707.07(g).*" In Non-final Rejection paper #12 (mailed 3/18/2004) and Final Rejection paper #5 (mailed 2/25/2002,) the Examiner

used 2 references and 1 reference, respectively, for art rejection. How can one conclude that they are of piecemeal examination?

4. Applicants' arguments filed on 9/23/2004 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitations.

a. Applicants' argument -- Kuriacose fails to disclose any method of predicting a DC value of a target block. Kuriacose's DPCM does not code both a predictive DC value and "the DC value" of a target block

Examiner's response -- The Examiner cited the passage in column 6, lines 33-46 of Kuriacose for teaching the recited feature "generating a predictive DC value of the a DC value of the target block." In the passage, DPCM is used for coding the DC coefficients. As shown in column 3, lines 58-64 and column 4, lines 3-8, each DC coefficient is associated with one block. The DPCM is well known in the art of image compression to be a prediction method. For example, if a series of DC values are 10, 12, 7, 8, 6, and 5. The DPCM at first codes the value "10". It then uses 10 as the predicted value for the second value "12", and codes the difference of the actual second value and the predicted value. That is 12-10 = 2. The procedure is to use n-1 value as the predicted value for n value, and code its difference except when n=1 because there is no n=0 value. Evidently, Kuriacose teaches coding a DC value for the n=1 block and a predictive DC value of n=2, 3 blocks.

b. Applicants' argument -- The Examiner points to no teaching, suggestion or motivation to modify and combine the cited patents. Applicants submit the disparities and

difficulties apparent in combining Kuriacose and Graham, which also defy any ready explanation by the Examiner, are a by-product of hindsight reasoning the Examiner employed using Applicants' disclosure. In contrast, to support a prima facie showing of obviousness, the requisite teaching or suggestion and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure.

Examiner's response -- The Examiner indeed provided motivation to modify and combine the cited patents as evident in the mailed Office Action. MPEP 706.02(j) requires: "To establish a prima facie case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." It was obvious to one of ordinary skill in the art of image compression, at the time of the invention, that a better prediction for a target image data value in a DPCM coding results a better compression. Furthermore, Graham explicitly states the advantage of better compression with adaptive prediction based on the direction of constant brightness lines (column 2, lines 10-50.) For the Applicants' information, the way DC coefficients form an array is shown in Fig. 6B of Wober et al. (US patent 5,729,631.) This was also obvious to one of ordinary skill in the art of image compression, at the time of the invention.

Claim Objections

5. Claim 38 is objected to because of the following informalities:

-- For Claim 38, the term "the left left upper block" shall be changed to "the left upper block".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 30-31, 37-39, 44-52, and 54-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuriacose et al. (US patent 5,11,292 cited previously) in view of Graham (US patent 2,905,756 cited previously.)

For Claims 37-39, Kuriacose a block based video coding apparatus (Figs. 1 and 3) comprising means for:

-- generating a predictive DC value of the a DC value of the target block; (column 6, lines 33-46; The DPCM inherently required the predictive value.)

-- performing DPCM coding on the predictive DC value and the DC value of the target block, therefore generating video information; (column 6, lines 33-46)

-- transmitting the video information to a decoder. (Figs. 1 and 3)

However, Kuriacose does not teach the features related to generating a predictive DC value with a selected DC value as recited in the above claims.

Graham teaches a DPCM coding system comprising means for:

-- (a) selecting a value a left pixel and a upper pixel based on a comparison of a first value and a second value, the first value being a difference between values of a left upper pixel and the left pixel, the second value being a difference between DC values of the left upper pixel and the upper pixel; (Fig. 3; column 6, lines 27-47; S_{01} is the upper pixel. S_{10} is the left pixel. S_{11} is the upper left pixel.) wherein

- obtaining a first differential value which is a difference between values of the upper left pixel and the upper block pixel; (Eqs. 3 and 4)

- obtaining a second differential value which is a difference between values of the upper left pixel and the left pixel; (Eqs. 3 and 4)

- comparing the first differential value with the second differential value; (Eqs. 3 and 4)

- selecting the value of the upper pixel, if the first differential value is larger than the second differential value; (Eq. 3)

- selecting the value of the left pixel, if the first differential value is smaller than the second differential value; (Eq. 4)

- wherein the first differential value and second differential value are absolute values; (Eqs. 3 and 4)

-- (b) predicting the selected value as a value of a target pixel, thereby generating a predictive value of the target pixel. (Fig. 3; column 6, lines 27-47; S_{00} is the target pixel.)

It is desirable to have a better compression of an image value array. The objection can be achieved with a better prediction for a target image data value. It was obvious to one of ordinary skill in the art, at the time of the invention to know that the DC components of Kuriacose's blocks form an image value array. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to use Graham's adaptive prediction means for Kuriacose's DPCM for coding the DC values of each block because the combination improves compression. In the combination:

-- the values of Graham's left, upper, and upper left pixels are substituted with Kuriacose's DC values of a left block (B3), upper block (B2), and upper left block (B1), respectively, for prediction process.

The above passages also teach the corresponding methods of Claims 1, 30-31, and 33-35.

For Claims 48-52, the above-cited passages of Kuriacose and Graham, their combination, and motivation also teach:

-- the selector circuitry recited in Claims 48, 49; (Fig. 3 of Graham)

-- the differential pulse code modulation coder recited in Claims 48 and 52; (110 of Fig. 3 of Kuriacose);

-- memory circuitry recited in Claim 50; (Fig. 3 of Graham; The computer receives all the three values. Inherently, the computer has a memory to store the values.)

-- the first and second subtractors and the comparator recited in Claim 50; (Fig. 3 of Graham; The computer generates results according to Eqs. 3 and 4. Therefore, the computer has the components.)

-- the absolute value calculator recited in Claim 51. (Fig. 3 of Graham; The computer generates results according to Eqs. 3 and 4. Therefore, the computer has the component.)

The above-cited passages of Kuriacose and Graham, their combination, and motivation therefore also teach the methods of Claims 44-47 corresponding to the apparatuses recited in Claims 48-51.

For Claims 54-57, the above-cited passages of Kuriacose and Graham, their combination, and motivation also teach:

A block based video coding method, comprising the steps of:

-- a) calculating a vertical gradient of DC coefficients of a left upper block (B1) and a left block (B3), and the horizontal gradient of DC coefficients of the left upper block (B1) and a upper block (82); (column 6, lines 33-46 of Kuriacose teaching generating DC coefficients; Eqs. 3 and 4 of Graham teaching calculating gradients; their combination teaching this feature)

-- b) comparing the vertical gradient with the horizontal gradient; (Eqs. 3 and 4 of Graham teaching said comparing; combination of Kuriacose and Graham teaching this feature)

-- c) selecting one of the UC coefficients of the left block (B3) and the upper block (B2) as the predictive DC coefficient of a target block (B); (Eqs. 3 and 4 of Graham teaching said selecting; combination of Kuriacose and Graham teaching this feature)

-- wherein said step c) includes the steps o f:

- c1) selecting the DC coefficient (DC_B2) of the upper block as the predicted DC coefficient (DC_P) of the target block if the horizontal gradient is larger than the vertical gradient; (Eq. 3 of Graham; combination of Kuriacose and Graham teaching this feature)

- c2) selecting the DC coefficient (DC_B3) of the left block as the predicted DC coefficient (DC_P) of the target block if the horizontal gradient is smaller than or equal to the vertical gradient; (Eq. 4 of Graham; combination of Kuriacose and Graham teaching this feature)

-- wherein the horizontal gradient and the vertical gradient are absolute values. (Eqs. 3 and 4 of Graham)

-- d) performing a differential pulse code modulation (DPCM) coding on the predictive DC coefficient (DC_P) and the DC coefficient (DC_B) of the target block, thereby generating prediction error (DC_T); (column 6, lines 33-46 of Kuriacose)

-- e) transmitting the prediction error to a decoder. (Figs. 1 and 3 of Kuriacose)

For Claims 58-61, Kuriacose a block based video coding apparatus (Figs. 1 and 3) comprising:

-- a DCT portion for receiving texture data, performing a discrete cosine transform (DCT) for the texture data, and outputting DCT coefficients including DC coefficients and AC coefficients; (column 5, line 46 to column 6, line 46; column 7, lines 9-30; Fig. 3A)

-- a DPCM coder for performing a differential pulse code modulation (DPCM) on the predictive DC coefficient (DC_P) and the DC coefficient (DC_B) of the target block, thereby generating prediction error (DC_T) and transmitting the prediction error to a decoder. (column 6, lines 33-46)

However, Kuriacose does not teach the features related to generating a predictive DC value with a selected DC value as recited in the above claims.

Graham teaches a DPCM coding system comprising means for:

-- a coefficient storage portion for temporarily storing the coefficients of the three adjacent values including the left upper value, the upper value and the left value and outputting the values; (column 5, lines 32-74; The delays 45, 46, and 44 are the storage portions that hold (store) temporarily the DC coefficients.)

-- a predictive value selector for receiving the values of said three adjacent values, selecting the predicted values of the target value between the upper value and the left value, and outputting the predicted value; (Fig. 3; column 6, lines 27-47; S_{01} is the upper pixel. S_{10} is the left pixel. S_{11} is the upper left pixel.)

-- wherein said predictive value selector comprises:

-- a first substractor in communication with the coefficient storage portion for determining the vertical gradient between the values of the left upper value and the left value; (Eqs. 3 and 4)

-- a second substractor in communication with the coefficient storage portion for determining the horizontal gradient between the left upper value and the upper value; (Eqs. 3 and 4)

-- a comparator in communication with the first and second subtractors for comparing the vertical gradient with the horizontal gradient; (Eqs. 3 and 4)

-- an absolute value calculator in communication with at least one of the first and the second subtractors. (Eqs. 3 and 4)

It is desirable to have a better compression of an image value array. The objection can be achieved with a better prediction for a target image data value. It was obvious to one of ordinary skill in the art, at the time of the invention to know that the DC components of Kuriacose's blocks form an image value array. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to use Graham's adaptive prediction means for Kuriacose's DPCM for coding the DC values of each block because the combination improves compression. In the combination:

-- a DC coefficient storage portion for temporarily storing the DC coefficients of the three adjacent blocks including the left upper block (B1), the upper block (B2) and the left block (B3) and outputting the DC coefficients;

-- a predictive block selector for receiving the DC coefficients of said three adjacent blocks, selecting the predicted DC coefficients of the target block between the DC coefficient (DC_B2) of the upper block and the DC coefficient (DC_B3) of the left block, and outputting the predicted DC coefficient;

-- wherein said predictive block selector comprises:

-- a first substractor in communication with the DC coefficient storage portion for determining the vertical gradient between the DC coefficient of the left upper block (B1) and the DC coefficient of the left block (B3);

-- a second substractor in communication with DC coefficient storage portion for determining the horizontal gradient between the DC coefficient of the left upper block (B1) and the DC coefficient of the upper block (B2);

-- a comparator in communication with the first and second subtractors for comparing the vertical gradient with the horizontal gradient;

-- an absolute value calculator in communication with at least one of the first and the second subtractors.

Conclusion

8. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). The Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9306 for After Final communications. TC 2600's customer service number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Examiner
Art Unit 2624

February 3, 2005